

## PATENT COOPERATION TREATY

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner  
 US Department of Commerce  
 United States Patent and Trademark  
 Office, PCT  
 2011 South Clark Place Room  
 CP2/5C24  
 Arlington, VA 22202  
 ETATS-UNIS D'AMERIQUE  
 in its capacity as elected Office

Date of mailing (day/month/year) 21 June 2001 (21.06.01)	
International application No. PCT/GB00/03825	Applicant's or agent's file reference WO37497PPC
International filing date (day/month/year) 05 October 2000 (05.10.00)	Priority date (day/month/year) 05 October 1999 (05.10.99)
Applicant BUNCE, Roger, Abraham et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:  
20 April 2001 (20.04.01)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was  
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No.: (41-22) 740.14.35	Authorized officer  Zakaria EL KHODARY  Telephone No.: (41-22) 338.83.38
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## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>W037497PPC</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/GB 00/ 03825</b>	International filing date (day/month/year) <b>05/10/2000</b>	(Earliest) Priority Date (day/month/year) <b>05/10/1999</b>
Applicant <b>THE UNIVERSITY OF BIRMINGHAM et al.</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.



the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :



contained in the international application in written form.



filed together with the international application in computer readable form.



furnished subsequently to this Authority in written form.



furnished subsequently to this Authority in computer readable form.



the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.



the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,



the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,



the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.



as suggested by the applicant.



because the applicant failed to suggest a figure.



because this figure better characterizes the invention.

2a



None of the figures.

## INTERNATIONAL SEARCH REPORT

PCT/GB 00/03825

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 G01N33/558 G01N33/543

According to International Patent Classification (IPC) or to both national classification and IPC

### B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G01N B01L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

### C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>WO 96 24060 A (BRITISH BIOCELL INT ;CHANDLER JOHN ANTHONY (GB)) 8 August 1996 (1996-08-08) page 8, line 14 - line 24 page 27, line 29 -page 29, line 10; figures 10,13 figure 7; example 5</p> <p>---</p>	1-21
X	<p>EP 0 596 867 A (BOEHRINGER MANNHEIM CORP) 11 May 1994 (1994-05-11) column 6, line 22 -column 7, line 45; figure 1</p> <p>---</p>	1-8,10
X	<p>WO 99 27364 A (QUIDEL CORP) 3 June 1999 (1999-06-03) page 3, line 16 - line 25; figures 4,5; examples 4-6</p> <p>---</p>	1-3,7,8, 10

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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

\*A\* document defining the general state of the art which is not considered to be of particular relevance

\*E\* earlier document but published on or after the international filing date

\*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

\*O\* document referring to an oral disclosure, use, exhibition or other means

\*P\* document published prior to the international filing date but later than the priority date claimed

\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*& document member of the same patent family

Date of the actual completion of the international search

2 March 2001

Date of mailing of the international search report

12/03/2001

Name and mailing address of the ISA  
European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
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Fax: (+31-70) 340-3016

Authorized officer

Hart-Davis, J

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 00/03825

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	✓ WO 93 03176 A (IDEXX LAB INC) 18 February 1993 (1993-02-18) claims 19,30-36 ---	1-3,7,8, 10
X	✓ EP 0 590 695 A (WALKER MATTHEW ROBERT ;BUNCE ROGER A (GB); GIBBONS JOHN E C (GB);) 6 April 1994 (1994-04-06) page 7, column 9, line 52 -column 10, line 7 ---	1-3,7,8, 10
X	✓ US 4 522 923 A (DEUTSCH ALICE ET AL) 11 June 1985 (1985-06-11) the whole document ---	1-3,7,8, 10
A	✓ US 5 354 692 A (YANG HSIN M ET AL) 11 October 1994 (1994-10-11) claims 10,14,15 -----	1-21

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 00/03825

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9624060	A	08-08-1996	AU 701018 B AU 4546396 A CA 2211383 A CN 1176698 A DE 69608880 D DE 69608880 T EP 0808457 A IL 117021 A JP 10513263 T US 6146589 A ZA 9600802 A	21-01-1999 21-08-1996 08-08-1996 18-03-1998 20-07-2000 07-12-2000 26-11-1997 31-12-1999 15-12-1998 14-11-2000 12-08-1996
EP 0596867	A	11-05-1994	US 4891313 A ES 2138628 T AT 113722 T CA 1336064 A DE 3852040 D DE 3852040 T DE 3856351 D EP 0397775 A JP 2694469 B WO 8906799 A US 5114673 A	02-01-1990 16-01-2000 15-11-1994 27-06-1995 08-12-1994 27-04-1995 26-08-1999 22-11-1990 24-12-1997 27-07-1989 19-05-1992
WO 9927364	A	03-06-1999	NONE	
WO 9303176	A	18-02-1993	US 5726010 A CA 2113351 A DE 69230884 D DE 69230884 T EP 0600929 A ES 2145745 T JP 6510602 T US 6007999 A US 5750333 A US 5726013 A	10-03-1998 18-02-1993 11-05-2000 05-10-2000 15-06-1994 16-07-2000 24-11-1994 28-12-1999 12-05-1998 10-03-1998
EP 0590695	A	06-04-1994	AT 126353 T DE 69021470 D DE 69021470 T DK 417243 T EP 0417243 A WO 9011519 A GB 2231150 A,B IE 901062 A JP 3505261 T US 5198193 A US 5354538 A	15-08-1995 14-09-1995 25-01-1996 18-09-1995 20-03-1991 04-10-1990 07-11-1990 19-06-1991 14-11-1991 30-03-1993 11-10-1994
US 4522923	A	11-06-1985	AU 3377384 A CA 1215321 A EP 0149006 A JP 60105963 A ZA 8407706 A	18-04-1985 16-12-1986 24-07-1985 11-06-1985 29-05-1985
US 5354692	A	11-10-1994	AU 664814 B AU 4846493 A CA 2120741 A	30-11-1995 29-03-1994 17-03-1994

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 00/03825

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5354692 A		CN 1092175 A	14-09-1994
		EP 0611450 A	24-08-1994
		JP 7501403 T	09-02-1995
		WO 9406013 A	17-03-1994
<hr/>			

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

PEARCE, Anthony/CARPENTER, David  
MARKS & CLERK  
Alpha Tower  
Suffolk Street Queensway  
Birmingham B1 1TT  
GRANDE BRETAGNE

## PCT

NOTIFICATION OF TRANSMITTAL OF  
THE INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT  
(PCT Rule 71.1)

Date of mailing (day/month/year)	15.01.2002
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Applicant's or agent's file reference WO37497PPC	<b>IMPORTANT NOTIFICATION</b>
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International application No. PCT/GB00/03825	International filing date (day/month/year) 05/10/2000	Priority date (day/month/year) 05/10/1999
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Applicant THE UNIVERSITY OF BIRMINGHAM et al.
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1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

#### 4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer  Danti, B  Tel. +49 89 2399-8161
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# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>WO37497PPC</b>		<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. <b>PCT/GB00/03825</b>	International filing date (day/month/year) <b>05/10/2000</b>	Priority date (day/month/year) <b>05/10/1999</b>	
International Patent Classification (IPC) or national classification and IPC <b>G01N33/558</b>			
Applicant <b>THE UNIVERSITY OF BIRMINGHAM et al.</b>			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> <li>I <input checked="" type="checkbox"/> Basis of the report</li> <li>II <input type="checkbox"/> Priority</li> <li>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li> <li>IV <input type="checkbox"/> Lack of unity of invention</li> <li>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li> <li>VI <input type="checkbox"/> Certain documents cited</li> <li>VII <input checked="" type="checkbox"/> Certain defects in the international application</li> <li>VIII <input type="checkbox"/> Certain observations on the international application</li> </ul>			
Date of submission of the demand  <b>20/04/2001</b>		Date of completion of this report  <b>15.01.2002</b>	
Name and mailing address of the international preliminary examining authority:  <b>European Patent Office</b> <b>D-80298 Munich</b> <b>Tel. +49 89 2399 - 0 Tx: 523656 epmu d</b> <b>Fax: +49 89 2399 - 4465</b>		Authorized officer  <b>Weijland, A</b>  Telephone No. +49 89 2399 7490 	



# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB00/03825

## I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):
- Description, pages:**

1-40 as originally filed

**Claims, No.:**

1-21 as originally filed

**Drawings, sheets:**

1/5-5/5 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB00/03825

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes:	Claims 5,10,15,17-19,21
	No:	Claims 1-4,6,7-9,11-14,16,20
Inventive step (IS)	Yes:	Claims
	No:	Claims 1-21
Industrial applicability (IA)	Yes:	Claims 1-21
	No:	Claims

2. Citations and explanations  
**see separate sheet**

**VII. Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:  
**see separate sheet**

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/GB00/03825

The following documents (D) are referred to in this report; the numbering will be adhered to the rest of the procedure:

- D1: WO 96 24060 A (BRITISH BIOCELL INT ;CHANDLER JOHN ANTHONY (GB)) 8 August 1996 (1996-08-08)
- D2: EP-A-0 596 867 (BOEHRINGER MANNHEIM CORP) 11 May 1994 (1994-05-11)
- D3: WO 99 27364 A (QUIDEL CORP) 3 June 1999 (1999-06-03)
- D4: WO 93 03176 A (IDEXX LAB INC) 18 February 1993 (1993-02-18)
- D5: EP-A-0 590 695 (WALKER MATTHEW ROBERT ;BUNCE ROGER A (GB); GIBBONS JOHN E C (GB);) 6 April 1994 (1994-04-06)
- D6: US-A-4 522 923 (DEUTSCH ALICE ET AL) 11 June 1985 (1985-06-11)

**SECTION V**

**1. Novelty (Article 33(2) PCT)**

**1.1 The subject matter of claims 1-4,6-9,11-14,16,20 is not novel.**

Claims 1-3 are anticipated by D1 to D6. Claim 11 is anticipated by D1 and D3.  
Claims 4, 6-9, 12-14,16, 20 are anticipated by D3.

D1 (abstract; page 6, second paragraph; page 8, third and fourth paragraph; Figure 1) describes an assay device and method for detecting the presence of an analyte in a sample ("aqueous liquid" according to present claim 2), in which there is sequential delivery of reagents by liquid circuits on membranes, wherein the release of reagents from the membrane in the flow ("fluid flow path", "barrier release means" and "wetting agent" according to present claims 1 and 3) towards the detection zone is controlled by influencing the hydrophobicity of the membrane by surfactants impregnated on the membrane ("fluid flow barrier...is moveable by..." according to present claim 1). The choice of the barrier will govern the rate of solubilization and release of reagents. The device comprises a porous membrane with several zones which intersect at the capture site ("interstices in a porous medium", "capture region" according to present claim 11).

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/GB00/03825

D2 (abstract; column 11, second paragraph) describes a solid support ("fluid flow device" according to present claim 1) to determine antibodies against HIV in a serum ("aqueous liquid" according to present claim 2) sample ("barrier release means...is moveable...", "wetting agent" according to present claims 1 and 3). An antibody to gp120 of HIV conjugated to an enzyme is incorporated into the first zone of a device ("fluid flow barrier" according to present claim 1). The mixture of antibodies against HIV and conjugated antibody to gp120 passes into a second zone, which contains HIV gp120 immobilized on a solid phase.

D3 (abstract; page 1, second paragraph; page 5, third paragraph; page 7, first paragraph; example 1; page 11, first and second paragraph) describes one step immunoassays carried out with devices containing sample wells ("sample application zone", "sample to be analysed is included in the liquid" according to present claims 16 and 20) having several zones of flow paths ("fluid flow control device", "aqueous liquid", "porous medium" according to present claims 1,2,7 respectively), consisting of macroporous supports ("synthetic polymers" according to present claim 5) that are separated by hydrophobic non-porous material comprising a capture zone ("capture region" according to present claim 11) containing a capture antibody viewable through a window ("visualizing agent application zone" according to present claims 12-14). A substrate is released from a liposome ("fluid flow barrier", "impregnated", "interstices of a porous medium" according to present claims 1,8) by the surfactant octyl-B-D-glucopyranoside ("barrier release means", "wetting agent", "surfactant", "octyl -B-D-glucopyranoside", "soluble" according to present claims 1,3,4,6,7, 9).

D4 (abstract; page 14, second paragraph) describes a flow chromatographic device ("fluid flow control device" according to present claim 1) and assay to detect an analyte in a sample ("aqueous liquid" according to present claim 2). A labelled specific binding reagent has been deposited and dried on the path ("fluid flow barrier" according to present claim 1) and upon contact with the fluid ("barrier release means", "wetting agent" according to present claims 1 and 3), it is dissolved in the sample allowing binding of the analyte to the binding reagent.

D5 (abstract; column 4, third paragraph) describes a liquid transfer device ("fluid flow device" according to present claim 1) comprising two channels and wherein

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/GB00/03825

reagents can be solubilized ("fluid flow barrier" according to present claim 1) by diluent flow ("barrier release means", "aqueous liquid", "wetting agent" according to present claims 1 to 3).

D6 (abstract, column 1, last paragraph) describes an apparatus ("fluid flow device" according to present claim 1) and method for conducting immuno-chemical reactions comprising at least three chambers containing different chemicals. The chambers are separated by barriers ("fluid flow barrier" according to claim 1) that can be breached by alkali ("barrier release means", "aqueous liquid", "wetting agent" according to present claims 1 to 3) in the solution.

1.2 Claims 5,10,15,17,18,19 and 21 are not disclosed in the prior art documents and are therefore novel.

2. Inventive step (Article 33(3) PCT)

Dependent claims 5,10,15,17,18,19 and 21 do not contain any features which, in combination with the features of claims 1 and 11 to which they refer, meet the requirements of the PCT in respect of inventive step, since they can be considered as mere alternatives, without resulting in any unexpected effect whatsoever.

**SECTION VII**

3. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in D1 to D6 is not mentioned in the description, nor are these documents identified therein.

# PCT

## REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference  
(if desired) (12 characters maximum)

W037497PPC

### Box No. I TITLE OF INVENTION

FLUID-FLOW CONTROL DEVICE

### Box No. II APPLICANT

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

The University of Birmingham  
Edgbaston  
Birmingham  
B15 2TT  
United Kingdom

☐ This person is also inventor.

Telephone No.

Facsimile No.

Teleprinter No.

State (that is, country) of nationality:  
United Kingdom

State (that is, country) of residence:  
United Kingdom

This person is applicant for the purposes of: ☐ all designated States ☒ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

### Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

BUNCE, Roger Abraham  
8 Kings Gardens  
Birmingham  
B30 1DZ  
United Kingdom

This person is:

☐ applicant only

☒ applicant and inventor

☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:  
United Kingdom

State (that is, country) of residence:  
United Kingdom

This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

☒ Further applicants and/or (further) inventors are indicated on a continuation sheet.

### Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: ☒ agent ☐ common representative

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

CARPENTER, David and PEARCE, Anthony Richmond  
Marks & Clerk  
Alpha Tower  
Suffolk Street Queensway  
Birmingham B1 1TT  
United Kingdom

Telephone No.

0121 643 5881

Facsimile No.

0121 606 4766

Teleprinter No.

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Continuation of Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)	
<i>If none of the following sub-boxes is used, this sheet should not be included in the request.</i>	
<p>Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)</i></p> <p>FREITAG, Helmut 144 Northfield Road Birmingham B30 1DX United Kingdom</p>	<p>This person is:</p> <p><input type="checkbox"/> applicant only</p> <p><input checked="" type="checkbox"/> applicant and inventor</p> <p><input type="checkbox"/> inventor only <i>(If this check-box is marked, do not fill in below.)</i></p>
State (that is, country) of nationality: United Kingdom	State (that is, country) of residence: United Kingdom
<p>This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input checked="" type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box</p>	
<p>Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)</i></p>	<p>This person is:</p> <p><input type="checkbox"/> applicant only</p> <p><input type="checkbox"/> applicant and inventor</p> <p><input type="checkbox"/> inventor only <i>(If this check-box is marked, do not fill in below.)</i></p>
State (that is, country) of nationality:	State (that is, country) of residence:
<p>This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box</p>	
<p>Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)</i></p>	<p>This person is:</p> <p><input type="checkbox"/> applicant only</p> <p><input type="checkbox"/> applicant and inventor</p> <p><input type="checkbox"/> inventor only <i>(If this check-box is marked, do not fill in below.)</i></p>
State (that is, country) of nationality:	State (that is, country) of residence:
<p>This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box</p>	
<p>Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)</i></p>	<p>This person is:</p> <p><input type="checkbox"/> applicant only</p> <p><input type="checkbox"/> applicant and inventor</p> <p><input type="checkbox"/> inventor only <i>(If this check-box is marked, do not fill in below.)</i></p>
State (that is, country) of nationality:	State (that is, country) of residence:
<p>This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box</p>	
<p><input type="checkbox"/> Further applicants and/or (further) inventors are indicated on another continuation sheet.</p>	

**Box No.V DESIGNATION OF STATES**

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes; at least one must be marked):

**Regional Patent**

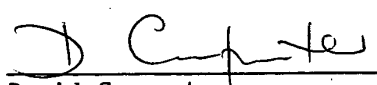
- ☒ **AP** ARIPO Patent: GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, MZ Mozambique, SD Sudan, SL Sierra Leone, SZ Swaziland, TZ United Republic of Tanzania, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☒ **EA** Eurasian Patent: AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ **EP** European Patent: AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☒ **OA** OAPI Patent: BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line) .....

**National Patent** (if other kind of protection or treatment desired, specify on dotted line):

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> <b>AE</b> United Arab Emirates                  | <input checked="" type="checkbox"/> <b>LC</b> Saint Lucia  |
| <input checked="" type="checkbox"/> <b>AG</b> Antigua and Barbuda                   | <input checked="" type="checkbox"/> <b>LK</b> Sri Lanka  |
| <input checked="" type="checkbox"/> <b>AL</b> Albania .....                         | <input checked="" type="checkbox"/> <b>LR</b> Liberia  |
| <input checked="" type="checkbox"/> <b>AM</b> Armenia .....                         | <input checked="" type="checkbox"/> <b>LS</b> Lesotho .....  |
| <input checked="" type="checkbox"/> <b>AT</b> Austria .....                         | <input checked="" type="checkbox"/> <b>LT</b> Lithuania  |
| <input checked="" type="checkbox"/> <b>AU</b> Australia .....                       | <input checked="" type="checkbox"/> <b>LU</b> Luxembourg   |
| <input checked="" type="checkbox"/> <b>AZ</b> Azerbaijan                            | <input checked="" type="checkbox"/> <b>LV</b> Latvia   |
| <input checked="" type="checkbox"/> <b>BA</b> Bosnia and Herzegovina .....          | <input checked="" type="checkbox"/> <b>MA</b> Morocco .....  |
| <input checked="" type="checkbox"/> <b>BB</b> Barbados                              | <input checked="" type="checkbox"/> <b>MD</b> Republic of Moldova .....                                    |
| <input checked="" type="checkbox"/> <b>BG</b> Bulgaria .....                        | <input checked="" type="checkbox"/> <b>MG</b> Madagascar .....   |
| <input checked="" type="checkbox"/> <b>BR</b> Brazil .....                          | <input checked="" type="checkbox"/> <b>MK</b> The former Yugoslav Republic of Macedonia .....              |
| <input checked="" type="checkbox"/> <b>BY</b> Belarus .....                         | <input checked="" type="checkbox"/> <b>MN</b> Mongolia   |
| <input checked="" type="checkbox"/> <b>BZ</b> Belize                                | <input checked="" type="checkbox"/> <b>MW</b> Malawi .....   |
| <input checked="" type="checkbox"/> <b>CA</b> Canada                                | <input checked="" type="checkbox"/> <b>MX</b> Mexico .....   |
| <input checked="" type="checkbox"/> <b>CH and LI</b> Switzerland and Liechtenstein  | <input checked="" type="checkbox"/> <b>MZ</b> Mozambique   |
| <input checked="" type="checkbox"/> <b>CN</b> China .....                           | <input checked="" type="checkbox"/> <b>NO</b> Norway   |
| <input checked="" type="checkbox"/> <b>CR</b> Costa Rica .....                      | <input checked="" type="checkbox"/> <b>NZ</b> New Zealand .....  |
| <input checked="" type="checkbox"/> <b>CU</b> Cuba .....                            | <input checked="" type="checkbox"/> <b>PL</b> Poland .....   |
| <input checked="" type="checkbox"/> <b>CZ</b> Czech Republic                        | <input checked="" type="checkbox"/> <b>PT</b> Portugal .....   |
| <input checked="" type="checkbox"/> <b>DE</b> Germany .....                         | <input checked="" type="checkbox"/> <b>RO</b> Romania  |
| <input checked="" type="checkbox"/> <b>DK</b> Denmark .....                         | <input checked="" type="checkbox"/> <b>RU</b> Russian Federation .....                                     |
| <input checked="" type="checkbox"/> <b>DM</b> Dominica                              | <input checked="" type="checkbox"/> <b>SD</b> Sudan  |
| <input checked="" type="checkbox"/> <b>DZ</b> Algeria .....                         | <input checked="" type="checkbox"/> <b>SE</b> Sweden   |
| <input checked="" type="checkbox"/> <b>EE</b> Estonia .....                         | <input checked="" type="checkbox"/> <b>SG</b> Singapore  |
| <input checked="" type="checkbox"/> <b>ES</b> Spain .....                           | <input checked="" type="checkbox"/> <b>SI</b> Slovenia .....   |
| <input checked="" type="checkbox"/> <b>FI</b> Finland .....                         | <input checked="" type="checkbox"/> <b>SK</b> Slovakia .....   |
| <input checked="" type="checkbox"/> <b>GB</b> United Kingdom                        | <input checked="" type="checkbox"/> <b>SL</b> Sierra Leone .....   |
| <input checked="" type="checkbox"/> <b>GD</b> Grenada                               | <input checked="" type="checkbox"/> <b>TJ</b> Tajikistan .....   |
| <input checked="" type="checkbox"/> <b>GE</b> Georgia .....                         | <input checked="" type="checkbox"/> <b>TM</b> Turkmenistan   |
| <input checked="" type="checkbox"/> <b>GH</b> Ghana                                 | <input checked="" type="checkbox"/> <b>TR</b> Turkey .....   |
| <input checked="" type="checkbox"/> <b>GM</b> Gambia                                | <input checked="" type="checkbox"/> <b>TT</b> Trinidad and Tobago .....                                    |
| <input checked="" type="checkbox"/> <b>HR</b> Croatia .....                         | <input checked="" type="checkbox"/> <b>TZ</b> United Republic of Tanzania                                  |
| <input checked="" type="checkbox"/> <b>HU</b> Hungary .....                         | <input checked="" type="checkbox"/> <b>UA</b> Ukraine  |
| <input checked="" type="checkbox"/> <b>ID</b> Indonesia                             | <input checked="" type="checkbox"/> <b>UG</b> Uganda .....   |
| <input checked="" type="checkbox"/> <b>IL</b> Israel .....                          | <input checked="" type="checkbox"/> <b>US</b> United States of America .....                               |
| <input checked="" type="checkbox"/> <b>IN</b> India .....                           | <input checked="" type="checkbox"/> <b>UZ</b> Uzbekistan .....   |
| <input checked="" type="checkbox"/> <b>IS</b> Iceland                               | <input checked="" type="checkbox"/> <b>VN</b> Viet Nam   |
| <input checked="" type="checkbox"/> <b>JP</b> Japan .....                           | <input checked="" type="checkbox"/> <b>YU</b> Yugoslavia .....   |
| <input checked="" type="checkbox"/> <b>KE</b> Kenya .....                           | <input checked="" type="checkbox"/> <b>ZA</b> South Africa .....   |
| <input checked="" type="checkbox"/> <b>KG</b> Kyrgyzstan .....                      | <input checked="" type="checkbox"/> <b>ZW</b> Zimbabwe .....   |
| <input checked="" type="checkbox"/> <b>KP</b> Democratic People's Republic of Korea | Check-box reserved for designating States which have become party to the PCT after issuance of this sheet: |
| <input checked="" type="checkbox"/> <b>KR</b> Republic of Korea                     | <input type="checkbox"/> .....   |
| <input checked="" type="checkbox"/> <b>KZ</b> Kazakhstan                            |  |

**Precautionary Designation Statement:** In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation (including fees) must reach the receiving Office within the 15-month time limit.)



<b>Box No. VI PRIORITY CLAIM</b>		<input type="checkbox"/> Further priority claims are indicated in the Supplemental Box.		
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country	regional application: regional Office	international application: receiving Office
item (1)  5 October 1999	9923384.3	United Kingdom		
item (2)				
item (3)				
<input checked="" type="checkbox"/> The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) <i>(only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office)</i> identified above as item(s): <u>1</u>				
<i>* Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.</i>				
<b>Box No. VII INTERNATIONAL SEARCHING AUTHORITY</b>				
<b>Choice of International Searching Authority (ISA)</b> <i>(if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):</i>		<b>Request to use results of earlier search; reference to that search</b> <i>(if search has been carried out by or requested from the International Searching Authority):</i>		
ISA / EP		Date (day/month/year)	Number	Country (or regional Office)
<b>Box No. VIII CHECK LIST; LANGUAGE OF FILING</b>				
This international application contains the following number of sheets: request : 4 description (excluding sequence listing part) : 40 claims : 4 abstract : 1 drawings : 5 sequence listing part of description : Total number of sheets <u>54</u>		This international application is accompanied by the item(s) marked below: 1. <input checked="" type="checkbox"/> fee calculation sheet 2. <input type="checkbox"/> separate signed power of attorney 3. <input type="checkbox"/> copy of general power of attorney; reference number, if any: 4. <input type="checkbox"/> statement explaining lack of signature 5. <input type="checkbox"/> priority document(s) identified in Box No. VI as item(s): 6. <input type="checkbox"/> translation of international application into (language): 7. <input type="checkbox"/> separate indications concerning deposited microorganism or other biological material 8. <input type="checkbox"/> nucleotide and/or amino acid sequence listing in computer readable form 9. <input checked="" type="checkbox"/> other (specify): PF 23/77		
Figure of the drawings which should accompany the abstract: 2a		Language of filing of the international application: English		
<b>Box No. IX SIGNATURE OF APPLICANT OR AGENT</b>				
Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).				
 David Carpenter				

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1. Date of actual receipt of the purported international application:  3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:  4. Date of timely receipt of the required corrections under PCT Article 11(2):  5. International Searching Authority (if two or more are competent): ISA /	2. Drawings:  <input type="checkbox"/> received:  <input type="checkbox"/> not received:  6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid.

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